

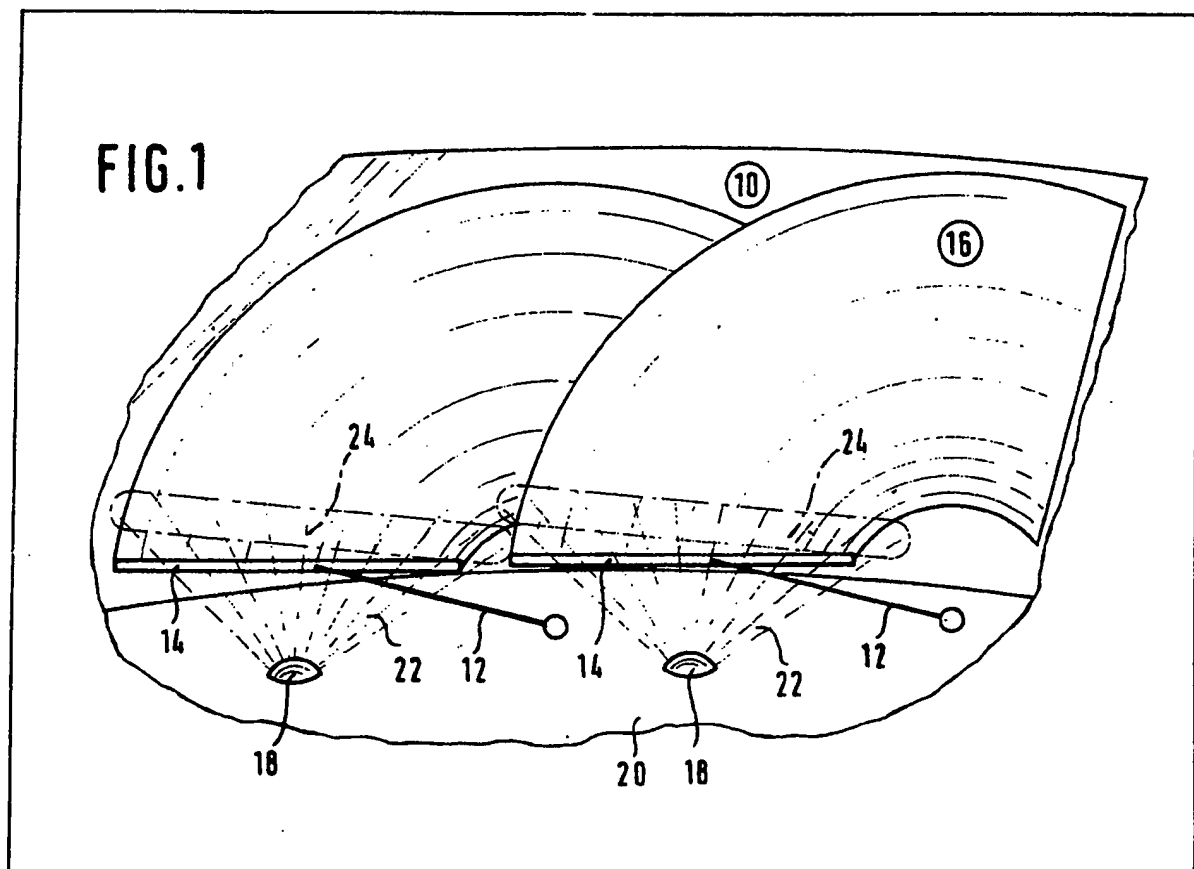
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(54) Cleaning system for screens of  
motor vehicles

(57) A windscreen cleaning system for motor vehicles includes at least one elongate wiping element (14) which is disposed so as to be displaceable at least approximately transversely of its longitudinal extent on the outer surface of the windscreen (10), and at least one spray nozzle (18) through which wash liquid is applied to the windscreen (10) to be cleaned. The jet of fluid emerging from the spray nozzle wets an elongate region (24) of the screen in the wiping zone (16), and the longitudinal extent of this region is located substantially parallel to the longitudinal extent of the wiping element when the latter passes across the wetted region (24) of the screen. Each spray nozzle (18) may have a flared outlet of elongate shape in cross section conforming to the shape of the elongate wetted region (24).



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FIG. 1

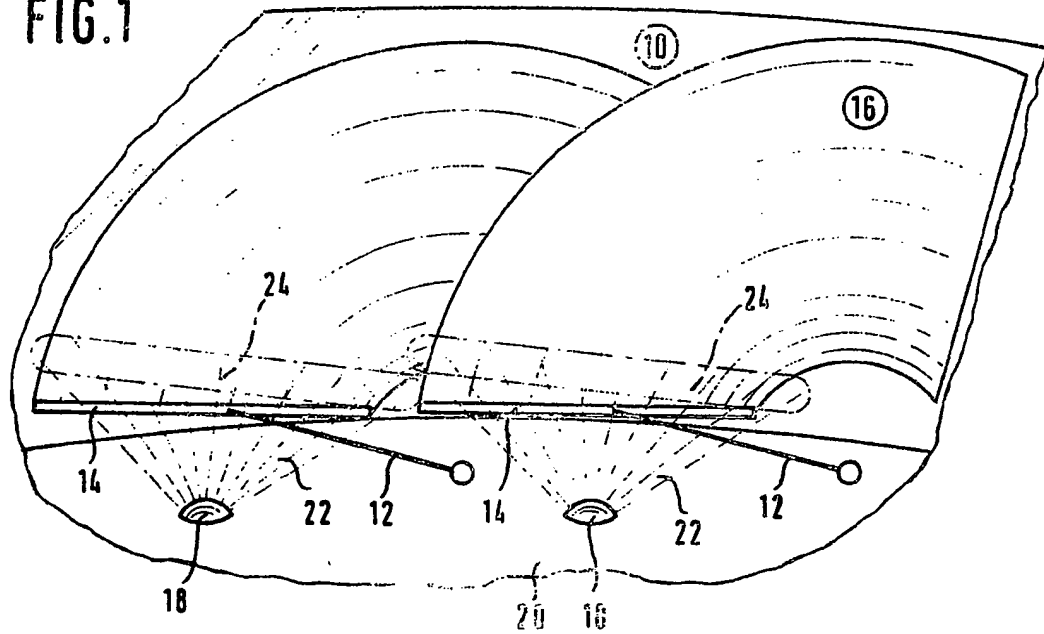


FIG. 3

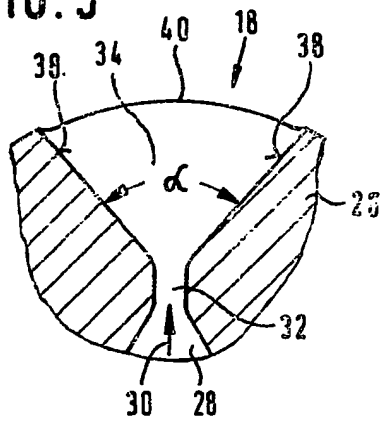


FIG. 4

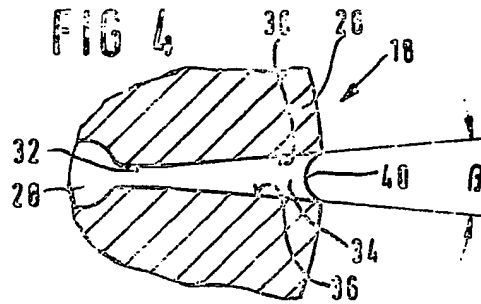
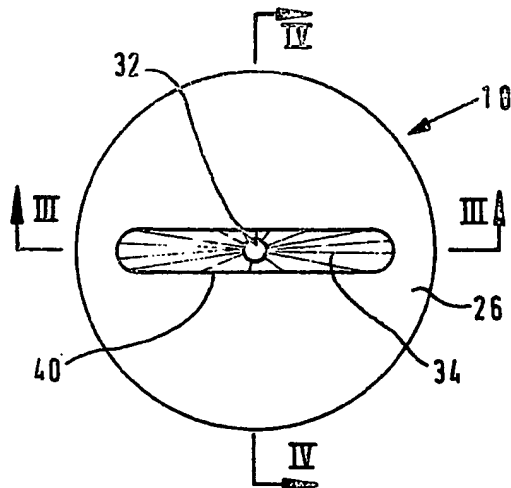


FIG. 2



## SPECIFICATION

### Cleaning system for screens of motor vehicles

5 The invention relates to a cleaning system for motor vehicle windscreens.

A cleaning system is already known in which a generally circular region of wiped zone of the screen is wetted. Thus, the wiping element moving across  
10 this region will only clean a narrow strip of the screen whose width corresponds to the diameter of the wetted region. Thus, washing fluid has to be applied to the screen several times, so that a portion of this washing fluid runs down the screen, whereby  
15 the width of the strip which is cleaned in the first instance becomes correspondingly wider. However, this procedure involves a considerable consumption of washing fluid. Furthermore, the period of time for cleaning the screen is prolonged. Finally, it is also  
20 frequently impossible also to clean the upper regions of the wiped zone by means of washing liquid, since the region over which the jet of liquid strikes the screen is frequently located in the central region of the wiped zone. Finally, the position of the strip  
25 cleaned by means of washing liquid in this known cleaning system also varies in accordance with the travelling velocity, since the sprayed jet is forced downwardly to a greater or lesser extent, that is to say, it is deflected, in dependence upon the travelling velocity. Therefore, adjustment of the spray nozzle to the upper region of the wiped zone will not  
30 have the desired effect at a high travelling velocity on, for example, a motorway.

In another cleaning system, in order to eliminate  
35 this disadvantage, a so-called wide jet nozzle for applying the washing liquid has been provided through which the entire screen is wetted at the same instant. In addition to the relatively high consumption of washing liquid, the driver's forward  
40 view is obstructed after the washing liquid has been applied until the washing liquid which has been sprayed onto the screen is wiped to the side by the wiping element.

The present invention resides in a cleaning system  
45 for a motor vehicle windscreen, comprising at least one elongate wiping element which is adapted to be arranged so as to be displaceable substantially transversely of its longitudinal extent over the outer surface of the screen, and at least one washing fluid  
50 dispensing spray nozzle which is adapted to be disposed at a distance from, and to be directed towards, the surface of the screen, and which is adapted to direct at least one jet of liquid so as to wet the surface of the screen in the zone, wiped by the wiping  
55 element, over an elongate region whose longitudinal extent is substantially parallel to the longitudinal extent of the wiping element when the wiping element moves across this region.

This has the advantage that substantially the  
60 entire surface of the screen wiped by the wiping element can be cleaned by means of washing liquid during the first pass of the wiping element with a relatively low consumption of washing liquid. In addition to this advantage, the sensitive wiping lip,  
65 which is rapidly worn during so-called dry wiping, is

also protected.

The invention is further described, by way of example, with reference to the drawings, in which:—

Figure 1 is an elevation of a windscreen of a motor  
70 vehicle,

Figure 2 is a plan view of a nozzle body for applying washing liquid to the windscreen, drawn to a larger scale,

Figure 3 is a fragmentary section taken on the line  
75 III-III of Figure 2, and

Figure 4 is a fragmentary section taken on the line  
IV-IV of Figure 2.

A motor vehicle windscreen 10, partially illustrated in Figure 1, is cleaned by means of a system which  
80 includes two wiping elements 14 which are displaceable on the outer surface of the screen by means of two swingingly driven wiper arms 12. The wiping elements 14 are hinged to the free ends of the wiper arms 12 and are formed by elongate, known  
85 wiper blades. During operation, the wiper blades 14 are displaced substantially transversely of their longitudinal extent across the outer surface of the windscreen 10. This results in a wiped zone 16  
90 formed by the two arcuate segments wiped by the wiper blades 14. Furthermore, the cleaning system includes two spray nozzles 18 which are disposed on the vehicle body 20 and whose mouths are directed into the wiping zone 16. Each of the two spray nozzles 18 produces a fan-like jet 22 of fluid which wets  
95 an elongate region 24 (shown by dash-dot lines in the drawing) on the screen. The longitudinal extent of this elongate wetted region 24 extends substantially parallel to the longitudinal extent of the wiper blade 14 when the wiper blade 14 passes across the  
100 wetted region 24. The length of the wetted region 24 is somewhat greater than the length of the wiper blade 14. Furthermore, each wetted region 24 is disposed relative to the arcuate segment wiped by each wiper blade 14 such that the two longitudinal ends of the wetted region extend beyond the outer and inner  
105 radii of the arcuate segments which are wiped. The wetted regions 24 are disposed relative to these arcuate segments such that the wetted regions 24 are located in the vicinity of the parked position,  
110 shown in Figure 1, of the wiping elements 14. Thus, the fan-like spray jet 22 is located in a region which is not affected to any great extent by the wind created when the motor vehicle is travelling, thus avoiding the undesirable deflection of the spray jet.

The above-mentioned, elongate jet 22 of fluid is obtained by means of a spray nozzle 18 of suitably designed construction. As will be seen in Figures 2 to 4, the nozzle body 26 of the spray nozzle 18 has a flow-through passage 28 for the washing fluid through which the washing fluid is forced in the direction of the arrow 30 (Figure 3). The flow-through passage 28 merges into a constriction 32  
120 beyond which is disposed a funnel-shaped or flared exit portion 34. The flared exit portion 34 is arranged such that it flares or diverges from the constriction 32. As will also be seen in Figures 2 to 4, the cross section of the funnel is elongate. Except for its size, the cross-sectional shape of the flared exit portion 34 corresponds substantially to the shape of the wetted  
125 regions 24 shown in Figure 1.  
130

When the washing fluid is forced through the flow-through passage 28 in the direction of the arrow 30 by means of a pump which forms part of the cleaning system, but which is of no significance in the present connection, and has passed through the constriction 32, a portion of the washing liquid is applied to the walls 36, 38 of the flared exit portion 34, whereby a cross section corresponding to the nozzle mouth 40 is imparted to the jet 22 of fluid. The angles  $\alpha$  and  $\beta$  formed by the walls 36 and 38 are chosen such that the dimensions of the wetted regions 24 conform to the requirements. Thus, the cross section of the nozzle mouth 40 essentially constitutes a reduction in the size of the wetted region 24. However, it will be appreciated that the desired effect can also be obtained by a plurality of smaller wetted regions, such as circular wetted regions, which are arranged in a row such that, considered overall, this row forms a single elongate region.

#### 20 CLAIMS

1. A cleaning system for a motor vehicle windscreen, comprising at least one elongate wiping element which is adapted to be arranged so as to be displaceable substantially transversely of its longitudinal extent over the outer surface of the screen, and at least one washing fluid dispensing spray nozzle which is adapted to be disposed at a distance from, and to be directed towards, the surface of the screen, and which is adapted to direct at least one jet of liquid so as to wet the surface of the screen in the zone, wiped by the wiping element, over an elongate region whose longitudinal extent is substantially parallel to the longitudinal extent of the wiping element when the wiping element moves across this region.

2. A cleaning system as claimed in claim 1, in which the length of the wetted region is at least as great as the length of the wiping element, and the wetted region is disposed such that it intersects the wiping zone of the wiping element transversely of the wiping direction.

3. A cleaning system as claimed in claim 1 or 2, in which the wetted region is located in the vicinity of a parked position of the wiping element.

4. A cleaning system as claimed in any of claims 1 to 3, in which the nozzle has a flared exit portion disposed downstream of a constriction in the flow-through passage of the spray nozzle, the flared exit portion diverging from the constriction towards the mouth of the nozzle.

5. A cleaning system as claimed in claim 4, in which the cross section of the mouth of the nozzle substantially represents a reduction in the size of the wetted region.

6. A cleaning system for a motor vehicle windscreen, constructed and adapted to operate substantially as herein described with reference to and as illustrated in the drawings.